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The Electrolux Group. The world's No.1 choice.

The Electrolux Group is the world's largest producer of powered appliances for kitchen, cleaning and outdoor use. More than 55 million Electrolux Group products (such as refrigerators, cookers, washing machines, vacuum cleaners, chain saws and lawn mowers) are sold each year to a value of approx. USD 14 billion in more than 150 countries around the world.



INSTRUCTION MANUAL

IMPORTANT INFORMATION: Please read these instructions carefully and make sure you understand them before using this unit. Retain these instructions for future reference.

BETRIEBSANWEISUNG WICHTIGE INFORMATION: Lesen Sie diese Hinweise zur Handhabung des Geräts aufmerksam durch. Verwenden Sie es erst, wenn Sie sicher sind, daß Sie alle Anweisungen verstanden haben und gut aufbewahren.

MANUEL D'INSTRUCTIONS RENSEIGNEMENTS IMPORTANTS: Avant d'utiliser cet appareil, veuillez lire attentivement les instructions et assurez-vous de les avoir comprises. Conservez les instructions pour référence ultérieure.

HANDLEIDING BELANGRIJKE IMPORTANTS: Lees deze handleiding aandachtig en zorg dat u alles begrijpt alvorens de kettingzaag te gebruiken en -be- waar ze voor toekomstige raadpleging.

BRUKERHÅNDBOK VIKTIG INFORMASJON: Les disse anvisningene nøyde og forsikre deg om at du forstår dem før du bruker enheten og oppbevar dem for senere bruk.

OHJEKIRJA TÄRKEÄÄ TIEDOT: Lue nämä ohjeet huolellisesti ja varmista, että olet ymmärtänyt ne, ennen kuin alat käyttää tätä laitetta ja säälytä myöhempää tarvitta varten.

BRUKSANVISNING VIKTIG INFORMATION: Läs instruktionerna noggrant och försäkra dig om att du förstår dem innan du använder utrustningen och spara dem för framtida behov.

BRUGERHÅNDBOG VIGTIGE OPLYSNINGER: Læs instruktionerne omhyggeligt, før du bruger enheden og gemme til senere henvisning.

MANUAL DE INSTRUCCIONES INFORMACIÓN IMPORTANTE: Lea atentamente las instrucciones y asegúrese de entenderlas antes de utilizar esta aparato. Conserve las instrucciones para la referencia en el futuro.

MANUAL DO OPERADOR INFORMAÇÕES IMPORTANTES: Queira ler cuidadosamente estas instruções e tenha certeza de entender-las antes de usar a serra e guarde para consulta futura.

LIBRETTO D'ISTRUZIONI

INFORMAZIONI IMPORTANTI: Leggere le istruzioni attentamente e capire bene prima di usare l'utensile. Conservare per ulteriore consultazione.

HASZNÁLATI ÚTMUTATÓ Jótállás vállalni csak rendeltetésszerű használatba vett gépekre tudunk. Kérj ü hogy a gép használata vétele előtt gondosan olvassa el a kezelési útmutatókat.

ΕΓΧΕΙΡΙΔΙΟ ΧΕΙΡΙΣΜΟΣ ΣΗΜΑΝΤΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ: Διαβάστε προσεχτικά αντίς της οδηγίες και Φροντίστε να τις χατανόφετε αντό το μηχάνημα και Φυλάξτε το για να το σωρθούνεστε στο μέλλον.

NAVOD K POUZIVANI DŮLEŽITÁ INFORMACE: Než začnete stroj používat přečtěte si prosím velmi pozorně tyto instrukce a ujistěte se, že jste jim porozuměli. Uschovějte si tento návod pro použití i v budoucnu.

INSTRUKCJA OBSŁUGI Gwarancja traci ważność w przypadku uwydania urządzenia do celów innych niż wymienione w instrukcji obsługi. Prosimy o uwagę przeczytanie instrukcji oraz o stoowanie się do zaleceń i wskazówek w niej zawartych.

NAVOD NA OBSLUHU DÔLEŽITÁ INFORMÁCIA: Pred použitím stroja si starostlivo prečítajte tento návod na obsluhu a uistite sa že ste mu dokladne porozumeli. Návod starostlivo uschovajte pre potrebu v budúcnosti.

РАБОЧИЕ ИНСТРУКЦИИ ВАЖНЫЕ СВЕДЕНИЯ: Внимательно прочитать и понять инструкции перед использованием оборудования. Хранить инструкции для дальнейших консультаций.

KASUTUSJUHEND TÄHTIS INFORMATSIOON: Lugege kasutusjuhend enne seadme kasutamist kindlasti põhjalikult läbi ning veenduge, et olete kõigest täpselt aru saanud.

ROKASGRAMMATA SVARIGA INFORMĀCIJA: Pirms ierīces izmantošanas uzmanīgi izlasiet rokasgrāmatu un pārleciņieties, ka jūs labi saprotat tās saturu. Saglabājiet rokasgrāmatu, lai nākoņot būtu iespējams atsādzināt jūsu zināšanas.

KULLANMA KYLAVUZU ÖNEMLİ TALİMATLAR: Buradaki bilgileri dikkatlice okuyunuz ve aleti kullanmaya başlamadan önce tüm talimatların tarafınızdan anlaşılmış olduğundan emin olunuz. Gerekli zaman başvurabilirseniz içün saklayınız.

ELECTRAMAC 235
ELECTRAMAC 312
ELECTRAMAC 314
ELECTRAMAC 316
ELECTRAMAC 330
ELECTRAMAC 335
ELECTRAMAC 340
ELECTRAMAC 414
ELECTRAMAC 416

ELECTRAMAC MC EX 16
ELECTRAMAC MES 1650

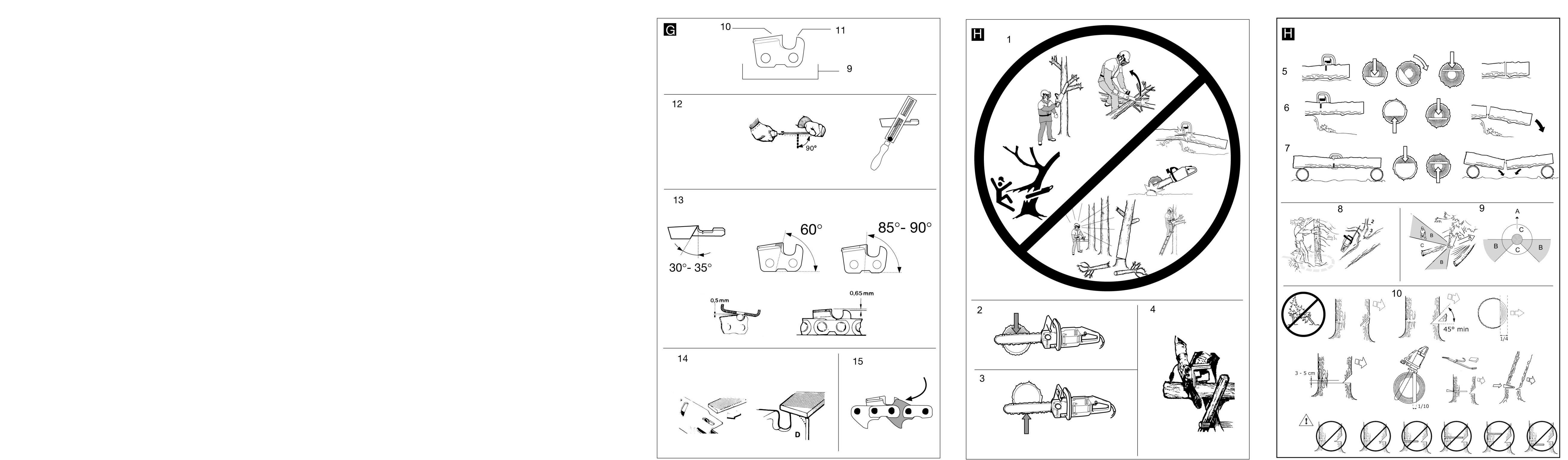
EUROMAC ES 312
EUROMAC ES 314
EUROMAC ES 316

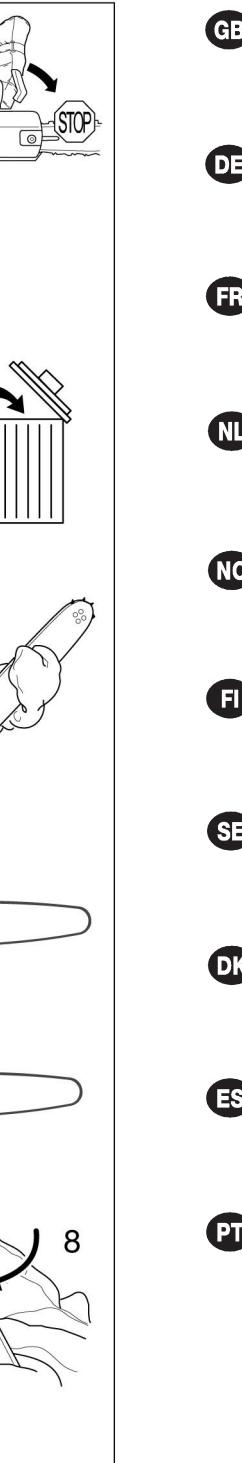
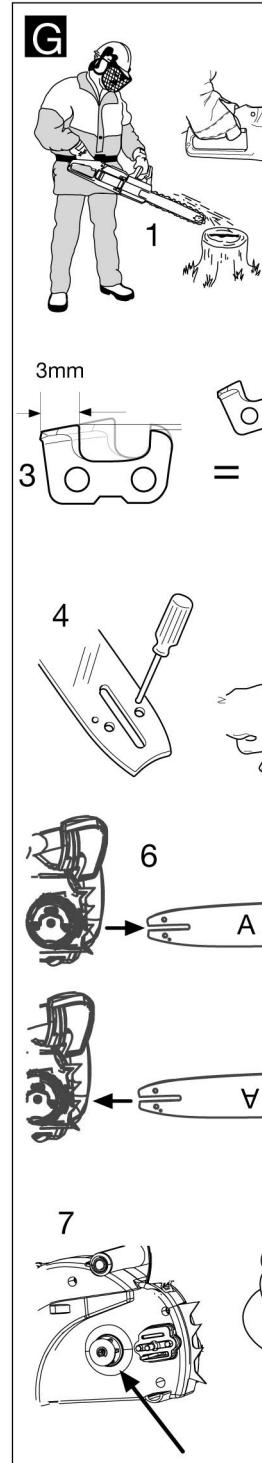
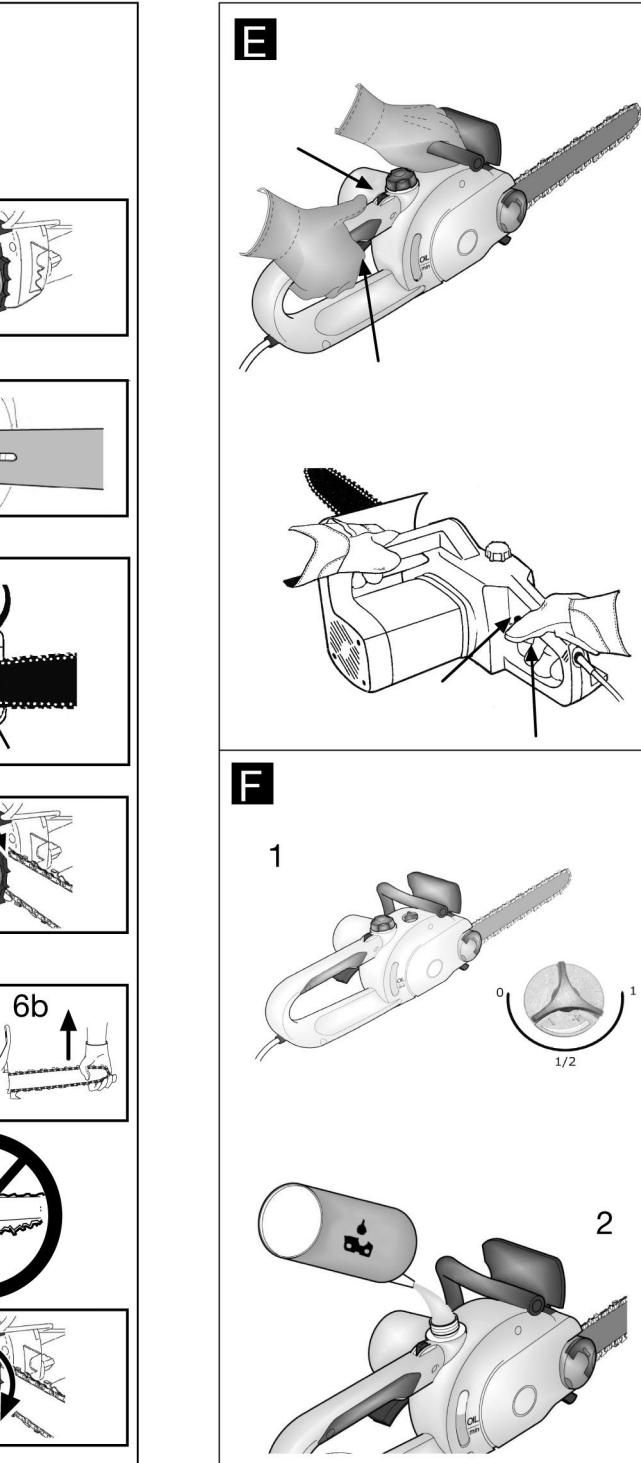
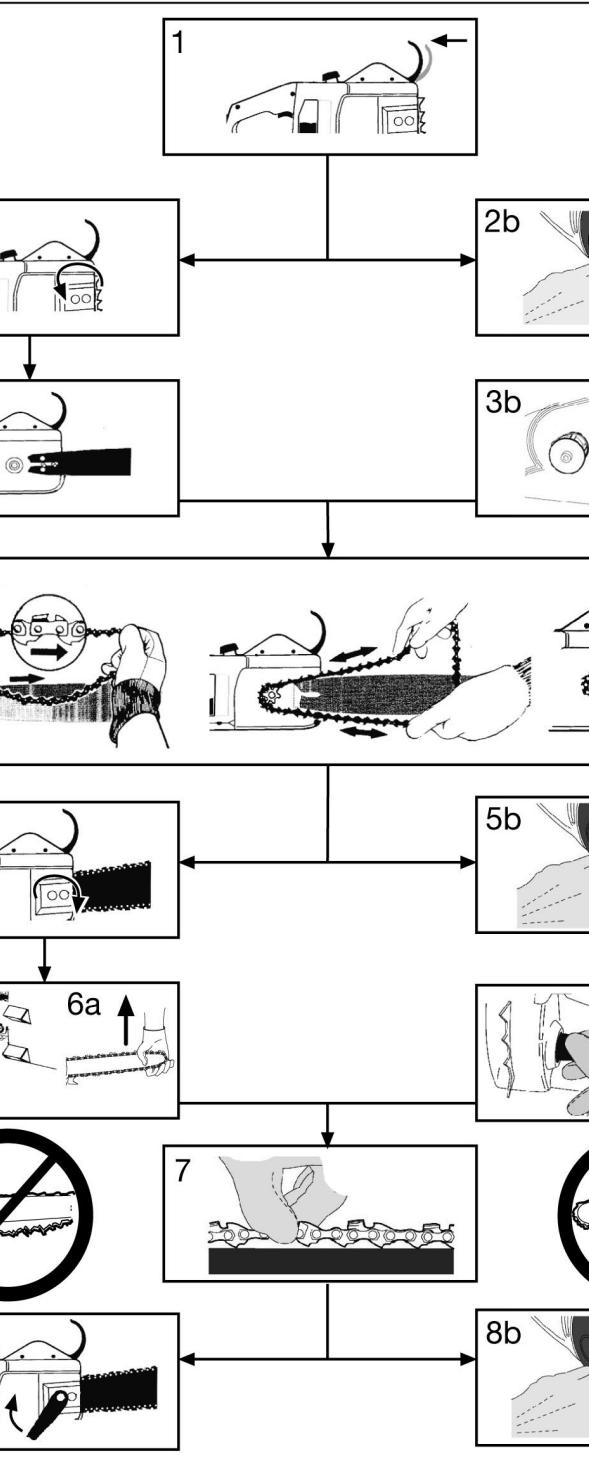
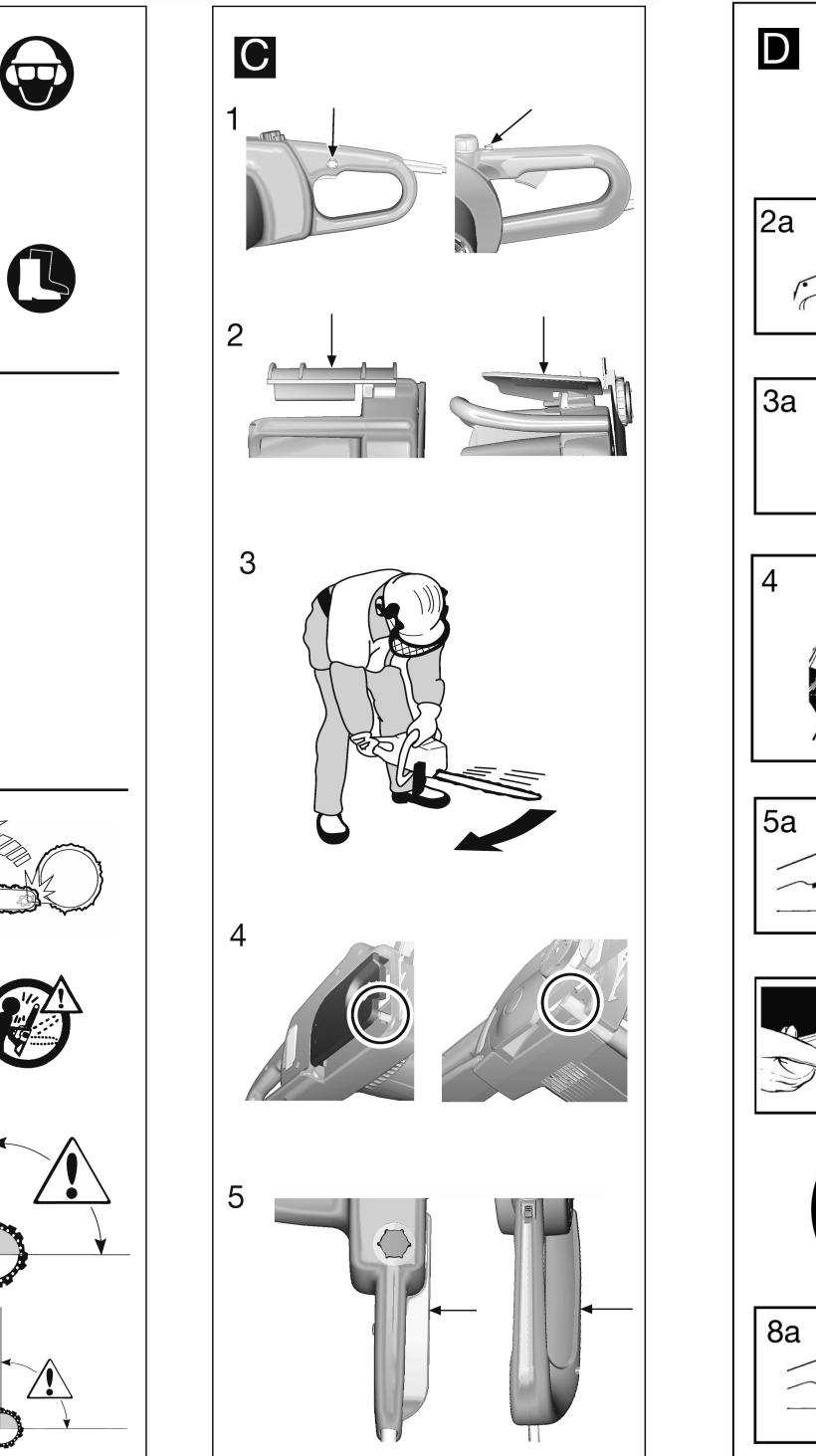
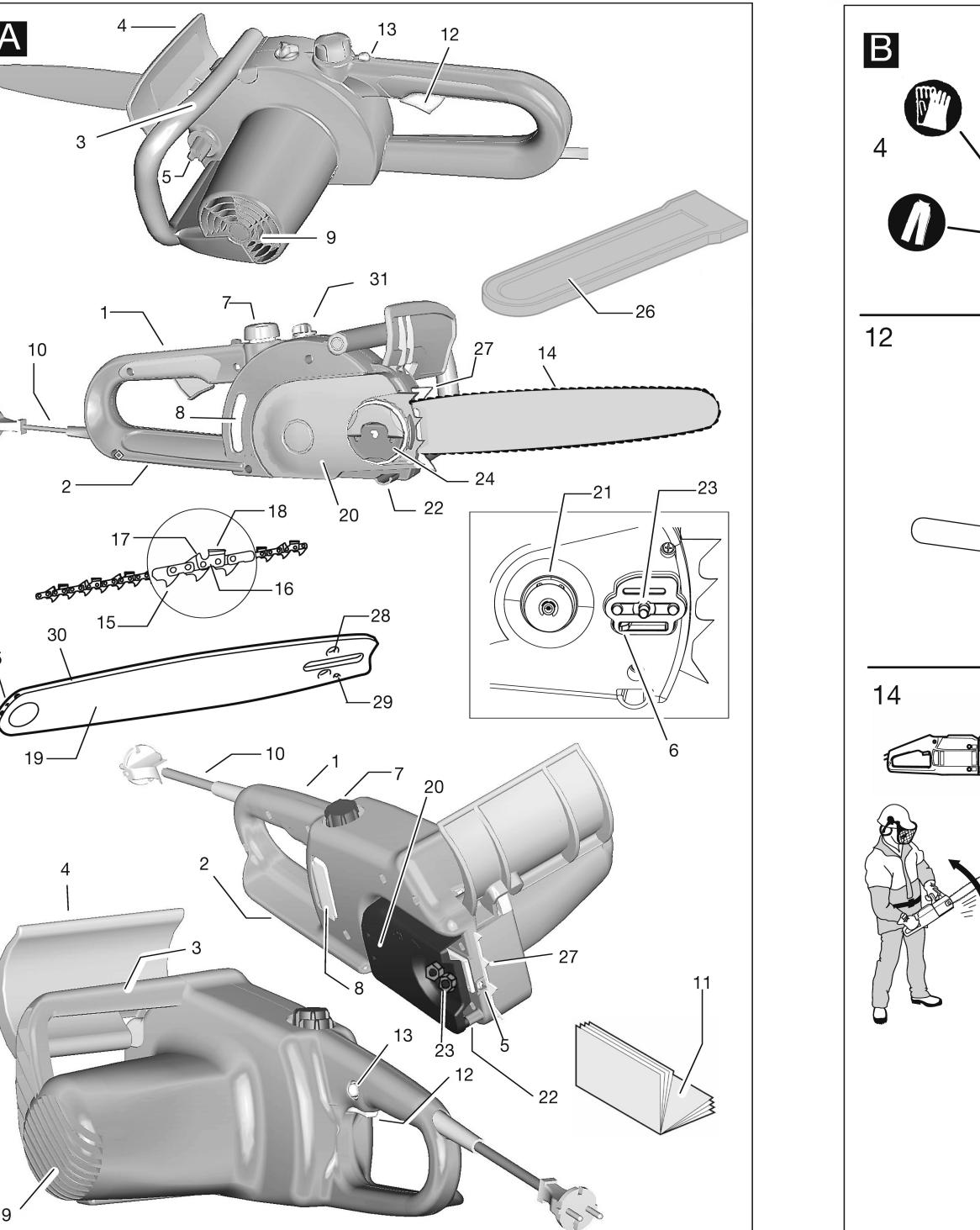
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P 1535
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TITANIUM 735
TITANIUM 740

PARTNER ES 18

WOODSHARK 350
WOODSHARK 400





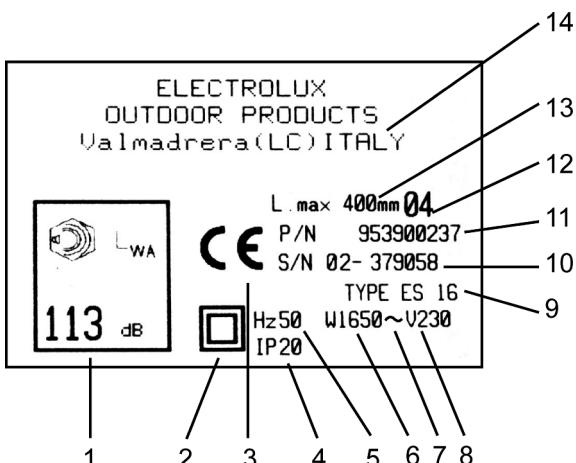
- GB** Due to a constant product improvement programme, the factory reserves the right to modify technical details mentioned in this manual without prior notice.
- DE** Im Sinne des Fortschritts behält sich der Hersteller das Recht vor, technische Änderungen ohne vorherigen Hinweis durchzuführen.
- FR** La Maison se réserve la possibilité de changer des caractéristiques et des données de ce manuel à n'importe quel moment et sans préavis.
- NL** Door constante produkt ontwikkeling behoudt de fabrikant zich het recht voor om technische specificaties zoals vermeld in deze handleiding te veranderen zonder biervan vooraf bericht te geven.
- NO** Produsenten forbeholder seg all rett og mulighet til å forandre tekniske detaljer i denne manuelen uten forhåndsvarsel.
- PL** W związku z programem ciągłego ulepszania swoich wyrobów, producent zastrzega sobie prawo do wprowadzania zmian w szczegółach technicznych wymienionych w tej instrukcji bez uprzedniego zawiadomienia. Instrukcja jest częścią wyposażenia
- SK** Proizvajalec si pridružuje pravico, da spremeni značilnosti in podatke priručnika v katerem koli trenutku in brez predhodnega obvestila.
- SE** Tillverkaren reserverar sig rätten att ändra fakta och uppgifter ur handboken utan förvarning.
- RU** Компания производитель сохраняет за собой право изменять характеристики и данные в настоящем руководстве, в любой момент и без предварительного извещения.
- EE** Tootja jätab endale õiguse muuta käesolevas kasutusjuhendis kirjeldatud omadusi ja andmeid suvalisel hetkel ja sellest eelnevalt ette teatamata.
- LV** Izgatavotājs saglabā tiesības jebkurā brīdī un bez brīdinājuma mainīt šajā rokasgrāmatā esošos datus un raksturīgumus.
- PT** A casa produtora se reserva a possibilidade de variar características e dados do presente manual em qualquer momento e sem aviso prévio.

- IT** La casa produtrice si riserva la possibilità di variare caratteristiche e dati del presente manuale in qualunque momento e senza preaviso.
- HU** A gyártó cég fenntartja a jogot arra, hogy a használati utasításban megadott adatokon és technikai tulajdonságokon bármikor és előzetes bejelentés nélkül változtasson.
- GR** Λόγω προγράμματος συνεχόμενης βελτίωσης τροπούτων, το εργοστάσιο επιφύλασσει του δικαιώματος να τροποποιεί τις τεχνικές λεπτομέρειες που αναφέρονται στο εγχειρίδιο αυτό χωρίς προηγούμενη ειδοποίηση.
- CZ** Vzhledem k pokračujícím inovacím si výrobce výhrazuje právo měnit technické hodnoty uvedené v této příručce bez predchozího upozornění.
- FI** Jatkuvan tuotteen parannusohjelman tähden valmistaja pidättää oikeuden vahtaa ilman ennakkovaroitusta tässä ohjekirjasessa mainittuja teknisiä yksityiskohtia.
- RU** Компания производитель сохраняет за собой право изменять характеристики и данные в настоящем руководстве, в любой момент и без предварительного извещения.
- DK** Producenten forbeholder sig ret til ændringer, hvad angår karakteristika og data i nærværende instruktion, når som helst og uden varsel.
- ES** La firma productora se reserva la posibilidad de cambiar las características y datos del presente manual en cualquier momento y sin previo aviso.
- TR** Üretici firma bu kullanma kılavuzunda yer alan özellik ve verilerin istediği zamanda ve haber vermekszin değiştirebilmek hakkını kendinde sahip tutar.

A. GENERAL DESCRIPTION

- | | |
|---------------------------------------|---------------------------------|
| 1) Rear handle | 17) Cutting depth gauge |
| 2) Rear hand guard | 18) Cutting tooth |
| 3) Front handle | 19) Bar |
| 4) Front hand guard/chain brake lever | 20) Chain cover |
| 5) Chain tensioner knob/screw | 21) Pinion |
| 6) Chain tensioner pin | 22) Chain catcher |
| 7) Oil tank cap | 23) Bar retaining screws |
| 8) Oil tank inspection gauge | 24) Bar retaining knob / nuts |
| 9) Air vents | 25) Nose sprocket |
| 10) Cable | 26) Guide bar cover guard |
| 11) Manual | 27) Spiked bumper |
| 12) Switch | 28) Chain tensioner pin housing |
| 13) Switch block | 29) Lubrication hole |
| 14) Chain | 30) Guide groove |
| 15) Drive tooth | 31) Oil pump adjustment knob |
| 16) Cutting link | |

LEGEND:

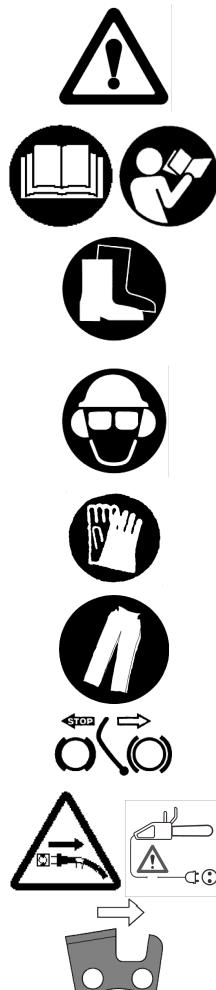


Example of identification label

- Guaranteed noise level according to directive 2000/14/EC
- Double insulation
- CE marking of conformity
- Protection degree
- Rated frequency
- Rated power
- Alternate current
- Rated voltage
- Model/type
- Prefix – Serial number
- Product code
- Year of manufacture (last two figures; e.g. 04=2004)
- Maximum bar length
- Manufacturer's name and address

B. SAFETY PRECAUTIONS

MEANING OF SYMBOLS



Warning!

Read the instruction manual carefully

Protective boots

Protective goggles or visor, protective helmet and hearing protection

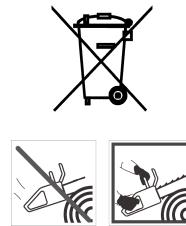
Protective cut-proof gloves

Protective long, cut-proof trousers

Chain brake: deactivated, activated

Disconnect the plug if the cable is damaged

Correct direction of the cutting teeth.



Do not dispose inappropriately of the machine. Deliver it to an authorized organization.



Always grip the machine with two hands



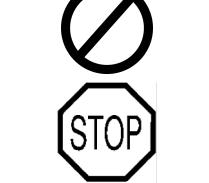
Kickback danger



Do not expose to rain or moisture.



Chain oil



Refrain from

Turn the machine off

Manual use. All persons using this machine must read the user manual completely with extreme care, (and where possible must also be present during a practical demonstration on correct machine use) in order to be familiar with all user operations in complete safety, as well as all the cutting techniques possible with this machine. For this reason, the user manual must be included with the machine in the case of sale or loan to another person. Please

remember that ALL parts of the user manual are important, as they are included to help prevent injury to the user and damage to the machine. Following correct manual procedure does not necessarily prevent all danger risk, but certainly reduces the probability or effects of injury or damage.

Manual layout: Section B is divided into various parts that are referred to in the rest of the manual and marked with the "Warning" sign, followed by the

reference number of the corresponding component to draw the reader's attention to the main safety procedure linked with that particular situation; the machine parts shown in "A – GENERAL DESCRIPTION" are indicated in *italics* in the text for easy identification.

Precautions prior to machine use. Never permit this machine to be used by any persons who are not perfectly familiar with the manual instructions, who are not in good physical and mental condition, who are not sufficiently competent and by children (local regulations may sometimes limit the age of operators permitted to use the machine). Inexperienced persons must follow a training period operating on a saw horse only. The user is responsible for any accidents that may cause injury to other persons and damage to property, as well as any other type of danger risk. The machine must never be used for operations other than those specifically described in this manual, and exclusively with the *bars* and *chains* indicated. This machine must never be used when users are tired, or not in good physical condition, or if under the effect of any substance that may alter their physical or mental condition (pharmaceuticals, alcohol, drugs etc.) Make certain that the user knows how to stop the motor and *chain* in case of necessity. Take great care and pay close attention at all times when using this machine, following all general behaviour rules according to good sense.

1. Control checks. Control the machine with care before use each time, especially if it has been subject to strong impact, or if it shows any signs of malfunction. Check that the machine has been assembled correctly, that all components are in correct condition and perfectly clean. Perform all operations described in the chapter "Maintenance – before each use". Make sure that all spanners and tools used for adjustment operations have been removed, that all screws and nuts are in their correct housing and tightened correctly, and that the *bar* and the *chain* are mounted correctly. If even one single condition described above is not satisfactory DO NOT USE the machine.

2. Repairs and Maintenance. All the machine parts that can be replaced personally, are clearly explained in the "Assembly / disassembly" instructions chapter. In the case of damaged or worn components, always use exclusively original homologated accessories and spare parts that are available from official distributors.

Where necessary, all other machine parts must be replaced exclusively by an Authorised Service Centre. All danger risks increase considerably if maintenance operations are not performed regularly, not performed by competent professional personnel, or if non-original accessories /spare parts are mounted on the machine. In any of the cases described above, the manufacturer will not be held responsible for any injury to persons or damage to property. In the case of any doubt, please contact an Authorised Service Centre.

3. Maintenance in complete safety. All maintenance, assembly, disassembly and oil tank filling operations must be performed with the machine set in a stable position on a flat solid surface and with the cable plug disconnected from the electricity supply (unless this is explicitly specified otherwise). The chain must be arrested and the user must wear suitable protective gloves.

4. Clothing. When using this machine the user must wear the following homologated individual protective clothing : close-fitting protective clothing, safety boots with non-slip soles, crush-proof toe puffs and cut-proof protection; cut-proof vibration-proof gloves, protective goggles or safety visor (remove protective film where present); ear protection muffs; helmet (if there is any danger of falling objects); some efficient method to cover or tie hair back from shoulder length (if hair is longer than shoulders); dust-proof mask. DO NOT WEAR shorts, loose clothing, unbuttoned clothing, or any jewellery that could become caught in moving machine parts. Do not wear sandals and never work bare-footed.

5. Health precautions – Vibrations and Noise levels. Avoid using the machine for long periods of time: the noise and vibrations can be dangerous causing irritation, stress, fatigue and hypacusia (hearing problems). Prolonged machine use exposes the user to vibrations that can generate "white finger phenomenon" (*Raynaud's Phenomenon*), carpal tunnel syndrome and similar disturbances. This can lead to a lack of sensitivity in the hands making it difficult to notice changes in temperature as well as causing numbness. When using the machine regularly or in continuation, the user must control the condition of his hands very carefully. If any of the symptoms described above appear, consult a doctor immediately.

6. Health precautions – Chemical agents. Avoid all chain oil contact with skin and eyes.

7. Health precautions - Electricity. All extension cords, plugs, and electricity lines must be homologated, to standard and in compliance with current regulations. Make sure that the main line to which the machine is connected is equipped with a residual current device (RCD) with a current capacity no higher than 30mA. Make sure that all cables, plugs, and the residual current device are in correct working condition, that they comply with required characteristics, are mounted or hooked up correctly and are perfectly clean. Never disconnect the machine from the main line by pulling on the cable. Never use or store the machine and extension cord in damp environments. If the cable is damaged in any way, disconnect immediately from the main line socket, taking great care not to touch any exposed wires. Avoid all contact with grounded surfaces when using the machine (metal piping, cables, lightening conductors, etc). When working outdoors, all extension cords attached to the machine must be homologated for use out of doors. Avoid tying any knots in electric cables and never use rolled up extension cords.

8. Health precautions - Heat. During use *pinion* and *chain* reach very high temperatures, take care not to touch these parts while hot.

9. Health precautions – Sharp or moving parts. Never touch the *chain* except when the machine is switched off; in any case, always take great care since the *chain* is very sharp and can cut even when stopped. Remember that the *chain* will continue to rotate for a short time after the machine has been switched off.

10. Work area. Control the whole work area carefully to check for any danger source (e.g.: roads, paths, electric cables, dangerous trees, etc) Take special care when working on sloping ground. Cluttered areas can lead to injuries: before using the machine remove any stones, glass, cables, metal components, cans, bottles and any other foreign matter from the work area. Also take into consideration any danger risks that may not be noticed because of machine noise. Make sure that a second person is within calling distance in the case of accident. When working in isolated areas, always carry a first aid kit and make sure you have advised others of your exact location.

11. Work operations

Never start work with the machine before performing the following: remove the *guide bar cover guard*; make sure that a sufficient amount of oil has reached the *chain*; make sure you have a planned retreat path from falling trees (when cutting trees).

It is strictly forbidden to use the machine for: moving branches or roots; in cases where there is any danger that the *chain* may come into contact with the ground, electric protection, or piled wood; for cutting very thin branches or bushes (these will break easily and can whip bystanders or the user causing serious injury); for felling trees without adequate training and equipment (correct ropes, hooks, etc); starting sawing operations with the blade already engaged in a previous groove or slit; using the machine while standing on stepladders or other unstable surfaces; using the machine in extreme weather conditions, inclement weather, with reduced visibility and insufficient lighting (very low temperatures, very hot damp climates, fog, rain, wind, at night, etc.); using the machine with arms stretched: work must always be performed in a manner to ensure that the user can react immediately to unexpected conditions; it is forbidden to leave the machine unguarded; permitting others to touch the cable, extension cord , or the machine; forcing the machine during cutting action (this can lead to motor damage or loss of control over the machine); blocking the *switch* or the *switch block* with adhesive tape or other materials.

Always remember to: cut wood only (never cut plastic, metal, or other materials); make sure that the *switch* is NOT turned ON before inserting the plug in the socket or releasing the *chain brake lever*; make sure that the *chain* is not in contact with any objects at the moment the *switch* is turned ON; Keep all bystanders and animals well clear of the work area (where necessary, fence off the area and use warning signs) at a minimum distance of 2.5 m times the trunk height; in any case no less than ten meters. Wherever possible use a vice or a saw horse to block the wood to be cut; always hold the machine as follows: Grip the *front handle* with the left hand and the *rear handle* with the right hand, closing the thumb and other fingers firmly around the handle (during use, the machine could slide forwards or backwards, or create a reverse action, provoking a kickback reaction: holding the machine correctly reduces the risk of loosing control over the tool); Always make

sure that the *cable*/ extension cord is kept behind the user, controlling that it does not create a source of danger for the user or for other persons, and check that it cannot be damaged (by heat, sharp objects, sharp edges, oil, etc); Always assume a stable standing position on both legs; keep the handles dry and clean; during use keep all body parts and clothing well clear of the *chain*; turn off the *switch*, wait until the chain has stopped turning, and activate the *chain brake lever* before putting down the saw; never attempt to cut at heights over shoulder height; always handle the machine with the utmost care; check that the oil level never drops below MIN level, controlling frequently, before and during use; Always remain on the left hand side of the machine during use, and take great care if the *bar* needs to be inserted in a previously cut slit; remove the *bar* from the slit when the *chain* is still in rotation.

12. Transport and storage precautions. Each time the work area is changed to another location, disconnect the machine from the main line and activate the *chain brake lever*. Mount the *guide bar cover guard* each time before transporting or storage. Always carry the machine by hand with the *bar* facing backwards, or when transporting the machine in a vehicle, always attach it securely to prevent damage. Never carry the machine by the *cable*. After use, store the machine in a dry, high place, far from heat sources and out of reach of children.

13. Precautions against fire risk. Never use the machine in areas where there are naked flames, inflammable or potentially explosive materials.

14. Kickback reaction. The kickback reaction consists of a violent upwards-reverse action of the *bar* towards the user. This generally occurs if the upper part of the *bar nose* (called the "kickback danger zone") comes into contact with some object, or if the *chain* is blocked in the wood. The kickback reaction is a very quick sudden motion along the *bar cutting plane* (generally in an upward direction, but this also depends on the machine position during cutting action). Kickback can make the user loose control of the machine provoking dangerous and even mortal accidents (i.e: if the saw with the *chain* in rotation is thrust back against the user). The *chain brake lever* and other safety devices are not sufficient to protect the user against injury: the user must be well aware of the conditions that can provoke the reaction, and prevent them by paying very close attention according to experience, together with prudent and correct machine handling (for example: never cut several branches at a time because this can cause accidental impact on the "kickback danger zone"; never mount incorrect *bars* or *chains*; make sure the *chain* is always sharp and sharpen according to correct methods, because incorrect sharpening can cause kickback; when choosing the *bar*, remember that the smaller the nose radius, the smaller the kickback danger zone).

C. SAFETY EQUIPMENT DESCRIPTION 1,3,6,8,12

SWITCH BLOCK

Your machine is equipped with a device (fig.1) that when deactivated, stops the *switch* from being pressed thus preventing accidental start-up.

CHAIN BRAKE ACTION ON SWITCH RELEASE (for ES18 models only)

Your machine is equipped with a device that blocks the *chain* immediately as soon as the *switch* is released; If this device should not work at any time, the machine must NOT be used, and must be taken to an Authorised Service Centre.

FRONT HAND GUARD / CHAIN BRAKE LEVER

The *front hand guard* (fig.2) is designed to prevent your left hand from coming into contact with the *chain* (on condition that the machine is held correctly according to instructions). The *front hand guard* also acts as a *chain brake*, including a device that blocks the *chain* in a few fractions of a second in the case of kickback. The *chain brake* is released when the *front hand guard* is pulled backwards and blocked in position (the *chain* is able to move). The *chain brake* is activated when the *front hand guard* is pushed forward (the *chain* is blocked).

The *chain brake* can be activated in two modes: the first using the left wrist by pushing forwards, or when it comes into contact with the brake system as a result of kickback; or by inertia, in the case of particularly violent kickback.

When the machine is used with the *bar* in horizontal position, for example during tree felling, the *chain brake* offers less protection, because it can be activated by inertia only, since the user's hand is outside the range of action of the *front hand guard* (fig.3).

N.B.: When the *chain brake* is activated, a safety switch cuts off all current to the motor.

CHAIN CATCHER

This machine is equipped with a *chain catcher* (fig.4) located under the *pinion*. This mechanism is designed to arrest the backward *chain* movement in the case of chain breaking or derailing. These situations can be avoided by ensuring correct chain tension (Refer to chapter "D. Assembly/disassembly").

REAR HAND GUARD

This acts to protect (fig.5) the hand in the case of *chain* breaking or derailing.

D. ASSEMBLY / DISASSEMBLY △ 2,3,6,7,8,9,12

BAR AND CHAIN ASSEMBLY

Assembly methods change according to the type of your machine- so please take care to refer to the illustrations and machine type marked on the label (A- Legend – 9 [ES15 / ES16 / ES18]), Take great care when assembling to ensure this is performed correctly.

FOR ES 15 / ES 16	FOR ES 18
1. Control that the <i>chain brake</i> is not activated. If so, deactivate it.	
2a. Unscrew the <i>bar retaining nuts</i> and remove the <i>chain cover</i> .	2b. Unscrew the <i>bar retaining knob</i> and remove the <i>chain cover</i> .
3a. Mount the <i>bar</i> on the <i>bar retaining screws</i> pushing it as far backward towards the <i>pinion</i> as possible.	3b. Mount the <i>bar</i> on the <i>bar retaining screw</i> pushing it as far backward towards the <i>pinion</i> as possible.
4. Oil the <i>chain</i> , then position it over the <i>pinion</i> , making it slide into the <i>bar guide groove</i> , beginning with the upper part. Attention! Control that the sharp side of the <i>cutting teeth</i> face in a frontward direction on the upper part of the <i>bar</i> ; Set the <i>chain tensioner pin</i> in the <i>chain tensioner pin housing</i> . Mount the <i>chain cover</i> making sure that the <i>drive teeth</i> of the <i>chain</i> are engaged in the <i>pinion</i> and in the <i>guide groove</i> .	
5a. Close the <i>bar retaining nuts</i> , screwing by hand.	5b. Screw the <i>bar retaining knob</i> loosely tightened.
6a. To spread the <i>chain</i> screw the <i>chain tensioner screws</i> in a clockwise direction, to loosen tension, screw in an anti-clockwise direction (when performing this operation maintain the <i>bar nose</i> raised upwards)	6b. To spread the <i>chain</i> screw the <i>chain tensioner knob</i> in a clockwise direction, to loosen tension, screw in an anti-clockwise direction (when performing this operation maintain the <i>bar nose</i> raised upwards)
7 Spread the <i>chain</i> until the tension is correct; that is, when the <i>chain</i> is pulled upwards, the <i>drive tooth</i> rises to the same level as the <i>bar</i> . (the <i>chain</i> must never droop on the underside of the <i>bar</i>)	
8a. Tighten the <i>bar retaining nuts</i> using an appropriate tool.	8b. Tighten the <i>bar retaining knob</i> strongly.

Tensioning the *chain* too tightly will overload the motor and cause damage, insufficient tension can provoke chain derailing, whereas a *chain* tightened correctly provides the best cutting characteristics and prolonged work life. Check the tension regularly because the chain length tends to stretch with use (especially when the chain is new; after the first assembly, the chain tension must be controlled after 5 minutes machine operation); in any

case do not tighten the chain immediately after use, but wait until it cools down.

In cases where the loosened chain needs to be adjusted, always unscrew the *bar retaining nuts / knob* before adjusting the *chain tensioning screw/knob* ; adjust the tension and tighten the *bar retaining nuts /knob* accordingly.

E. START-UP AND ARREST 1,4,5,6,7,8,9,11,12,13

Start-up: grip both handles firmly, release the *chain brake lever*, press and maintain the *switch block* pressed in, then press the *switch* (at this point the *switch block* can be released).

Arrest: The machine will stop whenever the switch is released. In the case where the machine does not stop, activate the *chain brake*, disconnect the cable from the main line socket and take the machine to the Authorised Service Centre.

F. BAR AND CHAIN LUBRICATION 3,6,7,8,9,12

ATTENTION! Insufficient lubrication will provoke chain breaking and can cause serious and even mortal injury.

Bar and chain lubrication is performed by an automatic pump. If your machine is equipped with an *oil pump adjustment knob* (optional) the chain lubrication can be adjusted as shown in the illustration (fig.1), according to the type of cutting operation in hand (dry wood – more oil, green wood - less oil, long bar- more oil, short bar - less oil).

Take great care to ensure that the *chain* is always sufficiently lubricated by never closing the pump completely. Refer to "Maintenance" for indications on ensuring that the chain oil is sufficiently distributed.

Choice of chain oil

Always use new oil only (special type for chains) with

adequate viscosity: the oil must adhere well and guarantee good running properties in both winter and summer. If chain oil is not available, EP 90 transmission oil can be used.

Never use waste oil because this is this harmful to health, the machine and the environment. Make sure that the oil is suitable for the temperature of the environment where the tool will be used: For temperatures under 0°C certain oils become denser, overloading the pump and causing damage. Contact your Authorised Service Centre for advice on oil choice.

Filling oil tank

Unscrew the *oil tank cap*, and fill the tank taking care not to spill any oil (if this occurs clean the machine carefully) (fig.2), and then screw the cap back on tightly.

G. MAINTENANCE 1,2,3,4,5,6,7,8,9,12,13

ATTENTION! In cases where work environments are particularly dirty or dusty, the operations described must be performed more frequently than mentioned in the instructions.

Before each use

Control that the chain oil pump functions correctly: direct the *bar* towards a clear surface at a distance of about 20 centimetres; after the machine has run for about a minute, the surface should show clear traces of oil (fig.1).

Check that excessive strength is not needed for activating and deactivating the *chain brake*. Also check that it is not activated too easily and that it is not blocked. Then check *chain brake* function as follows: release the *chain brake*, grip the machine correctly and start up the machine, activate the *chain brake* by pushing the *front hand guard* forward with the left wrist or arm but without removing the hand from the handle (fig.2). If the *chain brake* is working correctly, the *chain* should be blocked immediately.

Check that the *chain* is sharpened correctly (See below), in good working condition and that the tension is correct. If the *chain* is irregularly worn, or if the *cutting teeth* are only 3 mm high, the *chain* must be replaced(fig.3).

Clean the *air vents* regularly to prevent motor overheating.

Check that the *switch* and *switch block* function correctly (to be performed with the *chain brake* released): press the *switch* and the *switch block* and control that they return to idle position as soon as they are released; control that it is impossible to press the *switch* without activating the *switch block*.

Check that the *chain catcher* and the *right hand guard* are in correct condition without any visible faults such as damaged material.

Every 2-3 hours of use

Control the bar condition, if necessary clean the *lubrication holes*(fig.4) and the *guide grooves*(fig.5) carefully; If the groove is worn or shows signs of deep notching, it must be replaced. Turn the bar to ensure even wear(fig.6). Clean the *pinion* regularly and check that it has not been subject to excess wear(fig.7). Lubricate the *nose sprocket* with bearing grease through the hole shown in the illustration (fig.8).

Chain sharpening (When necessary)

If the *chain* does not cut correctly, or requires hard *bar* pressure against the wood, and if the sawdust is very fine, this is a sign that it is not sharpened correctly. If the cutting action produces no sawdust, this means the cutting edge has been worn completely and the chain is pulverising the wood during cutting. A well-sharpened chain crosses through the wood without effort or pressure and produces large long wood shavings.

The cutting side of the chain is composed of the *cutting link* (fig.9) with a *cutting tooth*(fig.10) and a *cutting limit gauge*(fig.11). The difference between these determines the cutting depth; a file guide and a 4mm diameter round file are needed to obtain good sharpening results; Follow the instructions below: Once the *chain* has been mounted and the tension is correctly adjusted, and the *chain brake* is activated, position the file guide perpendicular to the *bar* as shown in the illustration(fig.12), filing the *cutting teeth* at the angle shown(fig.13), always working from the interior towards the exterior, lessening the pressure during the return stage (it is very important to follow the instructions perfectly: excessive or insufficient sharpening angles, or an incorrect file diameter will increase the risk of kickback.) To obtain higher precision on side angles, it is advisable to position the file so that it exceeds the upper cutter by about 0.5 mm. File all the teeth on one side first, then turn the machine over and repeat the operation. Make sure that after sharpening operations, all teeth are the same length and that the height of the *depth gauge* is 0.6 mm lower than the upper cutter: check the height using a proper template and file (with a flat file) all protruding parts, rounding off the front part of the *depth gauge*(fig.14), paying attention to not file the *kickback protection tooth*(fig.15)

Every 30 hours use.

Take the machine to the Authorised Service Centre for general revision and control check on brake components.

PERIODS OF PROLONGED DISUSE

Always empty the fuel tank with the same precautions used in filling it.

H. CUTTING TECHNIQUES △ 1,2,3,4,5,6,7,8,9,10,11,12,13,14

When using the machine, prevent: (fig.1)

- cutting in conditions where the trunk could split during cutting (wood under pressure, dry dead trees, etc): sudden splitting can be very dangerous.
- the bar or the chain from becoming blocked in the cutting notch: if this should occur, disconnect the machine from the main electricity supply and try to raise the trunk using an appropriate tool as a lever; do not attempt to free the machine by shaking or pulling as this could cause damage or injury.

- situations that can lead to kickback reactions.

During machine use: (fig.1)

- When cutting on sloping ground, always work uphill of the trunk to avoid being hit if the trunk should roll downhill.
- Release the switch after each cutting action: prolonged dry running of the motor will provoke serious damage.
- When felling trees, always finish the job: a partially cut tree could break and fall.

- At the end of each cutting operation the user will notice a considerable change in the strength necessary for controlling the machine. Great care must be taken not to lose control .

Below is a description of two different types of cutting operation:

Cutting action by pulling the chain (from top to bottom) (fig.2) can lead to dangerous sudden movement of the machine towards the trunk with consequential loss of control. Where possible, use the spiked bumper during cutting operations.

Cutting action pushing the chain (from bottom to top) (fig.3) will lead to the danger of a sudden movement of the machine in the direction of the user, with the risk of hitting the user, or an impact of the "kickback danger zone" on the trunk resulting in strong kickback; extreme care must be taken when cutting in this manner.

The safest method for using the machine, is to block the log on a sawhorse, cutting from top to bottom, on the portion outside the sawhorse. (fig.4)

Spiked bumper use.

Where possible, use the spiked bumper to ensure safer cutting action: plant it in the bark or surface of the trunk in order to maintain more control over the machine.

Below are descriptions of typical cutting procedure to be adopted for specific situations. However, these should be assessed each time to calculate whether the method is most suitable or not, in order to use a method with the least possible risk.

Trunk on the ground. (Risk of touching the ground with the chain once the bar has passed through the trunk). (fig.5)

Cut from top to bottom through the whole trunk. Towards the end of the cut, proceed very carefully to prevent the chain from hitting the ground. If it is possible, cut 2/3 of the trunk, roll it over, and cut the remaining third from top to bottom to limit the risk of the chain touching the ground.

Trunk supported at one end only (Risk of trunk breaking during cutting action). (fig.6)

Begin the cut from underneath for about 1/3 of the diameter, and then finish the cutting action from the top to meet the undercut.

Trunk supported at both ends. (Risk of pinching the chain). (fig.7)

Begin the cut from above for about 1/3 of the diameter, and then continue from underneath to meet the undercut.

Tree felling.

ATTENTION! : Never attempt to fell a tree if you do not have the necessary experience, and in any case never fell trees that have trunks with a diameter larger than the length of the bar ! This operation is reserved for expert machine users with adequate equipment.

When felling a tree, the aim is to have the tree fall in the most convenient position for the following limbing and bucking operations. (Avoid trees falling on top of other trees: Felling trees that are entangled with other trees is a very dangerous operation).

First of all decide which is the best direction for the tree to fall by evaluating the following: objects or other plants around the tree, the inclination, the curve, wind direction, and greatest branch concentration. Take into account dead or broken branches that may break off during felling creating a further danger risk.

ATTENTION! During tree felling operations in critical conditions, always remove ear protection immediately after cutting operations to be able to listen for unusual noises and any warning signals.

Preliminary cutting operations and identifying the retreat path.

Eliminate any branches that interfere with the job (fig.8), starting from top to bottom, and then, always keeping the trunk between the user and the machine eliminate the more difficult branches afterwards, piece by piece. Eliminate all plants that interfere with work operations and control the area for possible obstacles (rocks, roots, ditches,etc.) when planning the retreat path (to follow during tree fall); Refer to the illustration (fig.9) for the directions to be maintained (A. predicted tree fall direction. B. Retreat path. C. Danger zone).

FELLING CUTS (fig.10)

In order to ensure that the user has complete control over the tree fall, the cutting instructions are as follows:

The cut that controls the fall direction of the tree is to be executed first: First of all cut the UPPER PART of the directional notch on the side the tree must fall. Remain on the right hand side of the tree and cut using the chain pull method; then cut the LOWER PART that must meet the end of the upper part. The depth of the directional notch must be 1/4 of the trunk diameter, with an angle of at least 45° between upper

and lower cut. The meeting point between the two sides of the notch is called "directional cut line". This line must be perfectly horizontal at right angles (90°) to the felling direction.

The felling cut that provokes the tree fall, is performed at 3 to 5 cm above the lower part of the directional felling cut line, finishing at a distance of 1/10 of the trunk from the notch. Remain on the left hand side of the tree and cut using the chain pulling method and the spiked bumper. Check that the tree does not move in a direction other than that predicted for the fall. As soon as possible insert a felling lever or wedge into the cut. The uncut part of the trunk is called the "hinge", as it is intended to guide the tree as it falls; in cases where the cuts are not sufficient, not straight, or have been cut through completely, the

tree fall cannot be controlled (extremely dangerous!). For this reason the various cuts must be performed with great precision.

When cutting operations are completed the tree will begin to fall. Where necessary help tree fall using wedges or felling levers .

Llimbing

Once the tree has been felled, the trunk must be limbed: in other words, the branches are removed from the trunk. Do not underestimate this operation because the large majority of kickback accidents occur during this stage. For this reason pay close attention to the position of the bar nose during cutting operations and always work on the left hand side of the trunk.

I. ENVIRONMENTAL INFORMATION

This section contains information useful for maintaining the characteristic of ecocompatibility included in the origin design of the machine, and as regards proper use and disposal of chain oil

DESIGN

In the design stage, care was taken to develop an engine with reduced consumption and low emission of noise.

USE OF THE MACHINE

The operations of filling the oil tank should be carried out in such a way as to avoid spilling oil and contaminating the soil and the environment.

DISPOSAL

Do not dispose inappropriately of the machine when it is no longer usable. Deliver it to an authorized organization for proper disposal in compliance with the regulation in force.

M. TROUBLESHOOTING TABLE

	Motor does not start	Motor turns with difficulty or loses power	The machine starts but does not cut properly	Motor turns improperly or at reduced speeds	Braking devices do not stop the chain properly
Make sure the main line is powered	●				
Make sure the machine is properly plugged in	●				
Make sure your cable/ext. cord is not damaged	●				
Make sure that <i>chain brake</i> is not activated	●				
Check that chain is properly assembled		●	●		
Check chain lubrication as in chapters F and G			●		
Make sure that the <i>chain</i> is sharp			●		
Contact your authorised centre	●	●		●	●

N. DECLARATION OF CONFORMITY

The undersigned, authorized by E.O.P.I., declares that the following products model: type ES15, ES 15/1, ES 15/2, ES16, ES 16/1, ES18 starting from 2004 onwards, manufactured by E.O.P.I., Valmadrera, Italy, comply with European Directive: 98/37/EEC (Machine Directive), 93/68/EEC (EEC Marking Directive) & 89/336/CEE (Electromagnetic Compatibility Devices), directive 2000/14/EEC (Enclosure V).



Valmadrera, 19/05/2004

Pino Todero (Technical Manager)
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O. Technical Data

Type:	ES 15	ES 16	ES 18
Dry weight (Kg)	3,5	3,5	3,5
Oil tank volume (cm ³)	200	200	150
Bar length (cm/inches)	30/12" 35/14"	40/16"	
Chain	MPG370GLX	91VJ	
Chain pitch (inches)	8,25/0,325"	8,25/0,325"	8,25/0,325"
Vibration	3/8	3/8	3/8
Front handle (m/s ²) (ISO 7505)	3,5	3,5	1,96
Rear handle (m/s ²) (ISO 7505)	7,9	7,9	7,30
Measured sound power level L _{W_{av}} dB(A) (ISO 9207)	111,14	111,14	103
Guaranteed sound power level L _{w_{av}} dB(A) (ISO 9207)	113	113	104
Sound pressure level at operator's ear dB(A) (EN 27182)	98	98	94
Minimum wire cross-section (wires num./mm ²)	2x1	2x1	2x1
Maximum cable length (m)	30	30	30